

[REDACTED]

UNCLASSIFIED

PUBLICLY RELEASABLE  
Per R. J. Townley, FSS-16 Date: 9-21-87  
By M. Ballois, CIC-14 Date: (U-1321) 8-22-96

*2 m B*  
LAMS - 373

[REDACTED]

COPY 2

April 6, 1946

This document contains 82 pages

SEMI-POPULAR MOTION-PICTURE RECORD OF THE TRINITY EXPLOSION

J. E. Mack

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[REDACTED]

CLASSIFICATION CANCELLED  
For The Atomic Energy Commission  
by the Declassification Officer  
per Bruce Harlow 153

[REDACTED]

[REDACTED]



To: N. E. Bradbury  
 From: J. E. Mack  
 Subject: Proposed semi-popular motion-picture record of the Trinity explosion.

I am enclosing prints of the titles we discussed today.

- I propose: (1) to submit the titles to a nationally circulated magazine for publication.  
 (2) to let a complete motion picture be made according to the scenario listed below, preferably for general commercial circulation as a "short", or if that is impossible, to be treated as an educational movie.

Item No.	Film Code	Times	100 m scale (cm)	Initial words
1	(tower)	pre	none	The first atomic bomb (use first alone, then with overlay for item 2)
2	(tower)	pre	none	(overlay, use with item 1) The bomb was exploded
3**	--			(Probably a formal title: authority, acknowledgements, etc.)
4*				(3 inch movie, without further introduction, and without overlay)
5	--			We have just seen
6	--			The pictures themselves
7	205	0.10-0.52ms	8	The ball has not
8	205	0.52-0.94ms	8	The limitation
9	205	3.53-6.23ms	1	Soon after the groundstrike
10	--			The belt near
11	--			But a shock wave
12**	--			(Animation: ordinary wave and shock wave)
13	203	6.8-9.2ms	1	The spikes have
14	18"	15ms	4.7	The belt, still hot
15	208	17.8-21.1ms	1	The Mach front, originally brighter
16	18"	25ms	5	The central ball
17	18"	25ms	5	Washington monument
18	18"	54ms	6	The Mach front belt
19	18"	44	5	The shock front and
20	18"	53	5	The shock wave is followed

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Item No.	Film Code	Times	100 m scale (cm)	Initial words
21	18"	62 ms	5	(no words)
22	18"	62 ms	5	This picture is the same
23	18"	72 ms	5	The dense shell
24	--			Geometric projection (cable refraction)
25**	--			(Animation: cable refraction)
26	18"	8ms	5	(no words)
27	18"	9ms	5	(no words)
28	18"	100ms	5	The belt is
29	18"	109ms	5	(no words)
30	18"	118ms	5	(no words)
31	18"	127ms	5	We shall revert
32	24"	250 ms	10	The camera was aimed
33	24"	0.01-0.50sec	10	(no words)
34	Aero	8.1 sec	0.2	The next four
35	Aero	11.5 sec	0.2	(no words)
36	Aero	14.8 sec	0.2	(no words)
37	Aero	18.1 sec	0.2	(no words)
38	18"	2.000 sec	5	Returning
39	3"	2 sec	1	This picture covers
40	3"	4 sec	1	A great general
41	--			The convective rise
42*	--			(Animation: convection)
43	3"	10 sec	1	The smoke from the vortex
44	3"	10 sec	1	Washington Monument, Empire State
45	3"	20 sec	1	The smoke cloud
46	3"	30 sec	1	In the dark
47	3"	60 sec	1	As it passes
48	Shue 1		none	The stem remains
49	--			Now let us (use first alone, then with overlays 49A to 49K)
A	--			(dial at 0/10)
B	--			(dial at 1/10)
C	--			(dial at 2/10)
D	--			(dial at 3/10)
E	--			(dial at 4/10)

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Item No.	Film Code	Times	100 m scale (om)	Initial words
49F	--		(dial at 5/10)	
G	--		(dial at 6/10)	
H	--		(dial at 7/10)	
I	--		(dial at 8/10)	
J	--		(dial at 9/10)	
K	--		= 49A	
50 XX	--		Camera position 5.8...24	
51 **	--		(disc for predicting explosion location exact location be determined)	
52 X	--		(3" movie, use with overlays 42A to 49J cyclicly, averaging 2.4 frames per overlay)	
53 **	--		Camera position 5.8...107.1	
54 **	--		= 51	
55 X	--		(18" movie, use with 49A to 49J cyclicly, averaging 10.7 frames per overlay)	
56 **	--		Camera position 5.8...119	
57 **	--		= 51	
58 X	--		(25" movie use with 49A to 49J cyclicly, averaging 11.9 frames per overlay)	
59 **	--		Camera position 5.8... 660	
60 XX	--		= 51	
61 X	--		(movie 211, use with 49A to 49J cyclicly, 66 frames per overlay)	
62 **	--		Camera position 5.8...651	
63 **	--		= 51	
64 X	--		(movie 209 use with 49A to 49J cyclicly 65.1 frames per overlay)	
65 **	--		Camera position 5.8...3560	
66 **	--		= 51	
67 X	--		(movie 210, use with 49A to 49J cyclicly, 356 frames per overlay)	
68 **	--		Camera position 5.8...3760	
69 **	--		= 51	
70 X	--		(movie 208, use with 49A to 49J cyclicly 376 frames per overlay)	
71 XX	--		Camera position 0.45...3700	
72 X	--		= 51	
73 X	--		(movie 203 use with 49A to 49J cyclicly, 370 frames per overlay)	
74 **	--		Camera position 0.45...7110	

Item No.	Film Code	Times	100 m scale (cm)	Initial words
75**	--		=51	
76X	--		(movie 205, use with 49A to 49J cyclicly, 711 frames per overlay)	
77	Shes 2		The end	

\* Each listed "movie" is, of course, omitted here. It would be run just as it was taken, except that the relatively uninteresting later part might be deleted, and each frame would be overlaid with a time dial except in the case of item 4.

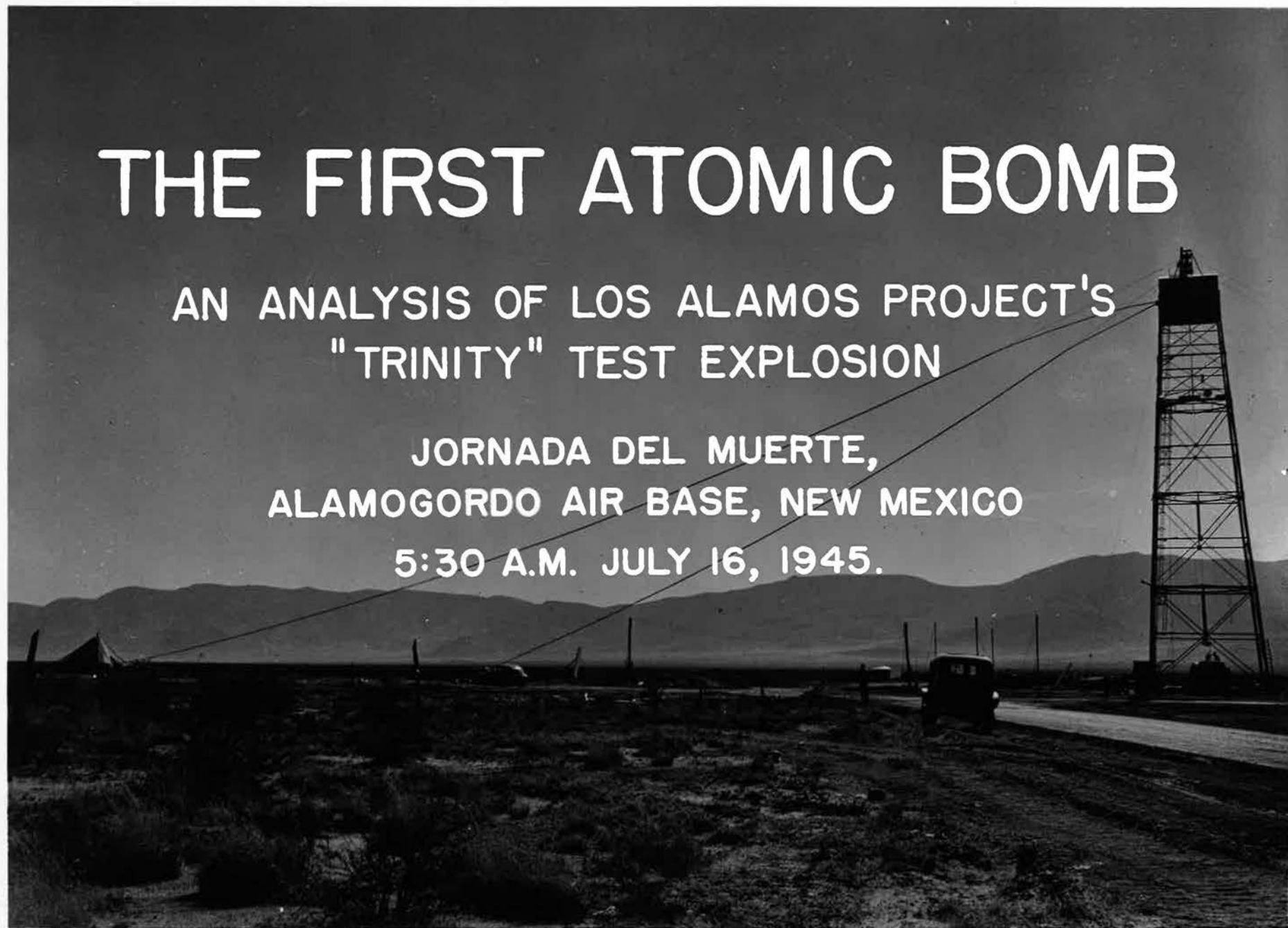
\*\* This item cannot be completed until the technical details of the motion picture are determined. Items 3, 12, 25, and 42 are omitted here. The rest are shown, incomplete.

# THE FIRST ATOMIC BOMB

AN ANALYSIS OF LOS ALAMOS PROJECT'S  
"TRINITY" TEST EXPLOSION

JORNADA DEL MUERTE,  
ALAMOGORDO AIR BASE, NEW MEXICO

5:30 A.M. JULY 16, 1945.



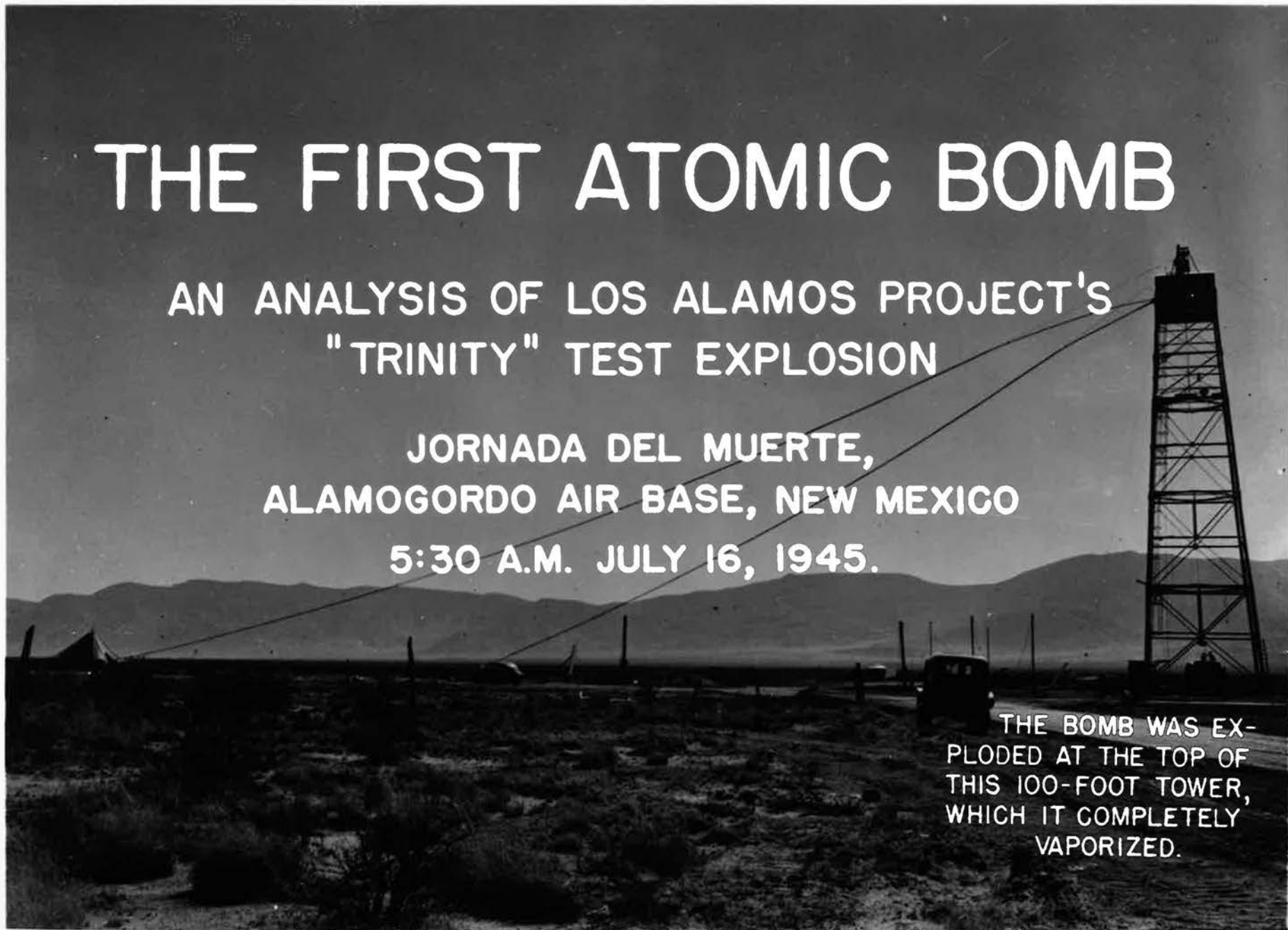
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JORNADA DEL MUERTE,  
ALAMOGORDO AIR BASE, NEW MEXICO

5:30 A.M. JULY 16, 1945.

THE BOMB WAS EX-  
PLODED AT THE TOP OF  
THIS 100-FOOT TOWER,  
WHICH IT COMPLETELY  
VAPORIZED.



WE HAVE JUST SEEN THE EXPLOSION AT ITS NATURAL SPEED, AS IT APPEARED FROM A DISTANCE OF 5.8 MILES.

IN ORDER TO APPRECIATE SOME OF THE DETAILS, WE SHALL NOW STUDY CERTAIN INDIVIDUAL FRAMES FROM SEVERAL MOTION PICTURES OF THE EXPLOSION.


ALTHOUGH THE SEQUENCE OF STUDIES IS ROUGHLY CHRONOLOGICAL, FOR THE SAKE OF CONTINUITY OF STUDY THERE IS SOME DEPARTURE FROM CHRONOLOGICAL ORDER. FOR INSTANCE, THE SHOCK WAVE IS FOLLOWED FROM 0 TO 18 SECONDS BEFORE THE START OF THE STUDY OF THE RISE OF THE SMOKE CLOUD, AT 2 SECONDS.



THE PICTURES THEMSELVES GIVE NO IDEA OF THE BRIGHTNESS, OR OF TIME AND SPACE SCALES.

THE OBJECT YOU SEE IS, FOR THE FIRST FEW FRAMES, MANY TIMES BRIGHTER THAN THE SUN, AND, FOR A CONSIDERABLE FRACTION OF A SECOND AFTER THAT, BRIGHTER THAN ANY LIGHT EVER PRODUCED BEFORE ON EARTH. SINCE THE EXPLOSION OCCURRED JUST BEFORE DAWN, THE LAST VIEW OF THE ASCENDING CLOUD IS VERY DIM.

THE TIME IS GIVEN FOR EACH FRAME OF THE STUDY SEQUENCE IN THOUSANDTHS OF A SECOND (MILLISECONDS, "MS") OR IN SECONDS, "SEC". THE DIRECTION OF THE CAMERA STATION IS GIVEN AS "N", "NW", OR "W".

THE LINEAR SCALE IS GIVEN BY A BAR  REPRESENTING 100 METERS, OR ABOUT 328 FEET. TO HELP YOU APPRECIATE THIS SCALE, SILHOUETTES OF FAMILIAR BUILDINGS ARE INSERTED IN SEVERAL OF THE FRAMES.



0.10 MS.  
W

THE BALL HAS  
NOT YET TOUCHED  
THE GROUND.



0.24 MS.

NOTE THE BLIS-  
TERS AROUND  
THE EDGE,  
AND THE HOT,  
CONSTRICTED  
BOTTOM.



0.38 MS.



0.52 MS.

NOTE THE APPEAR-  
ANCE OF SPIKES  
AT LOWER LEFT  
AND RIGHT.



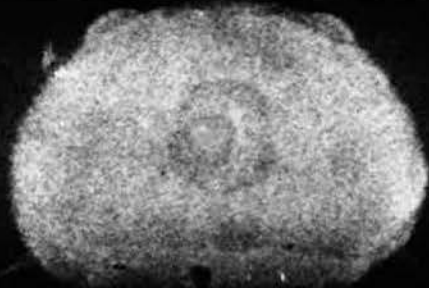
0.52 MS.  
W

THE LIMITATION AT  
TOP & BOTTOM IS  
DUE TO THE  
FRAME LINE.



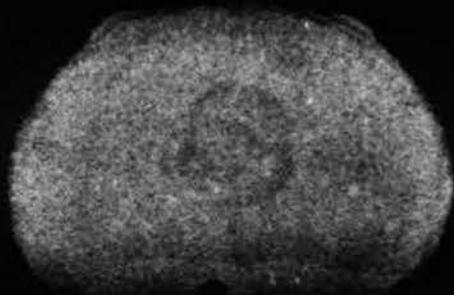
0.66 MS.

THE BALL HAS  
REACHED GROUND  
AT ABOUT 0.65 MS.



0.80 MS.

NOTE THE GROWTH  
OF THE SPIKES.



0.94 MS.

THE BLISTERS HAVE  
DISAPPEARED,  
LEAVING A SMOOTH  
EDGE.

353 MS  
N



SPIKE, PARTLY HIDDEN BY  
TELEPHONE POLES

3.80



4.07



4.34



4.61



5.15



5.69



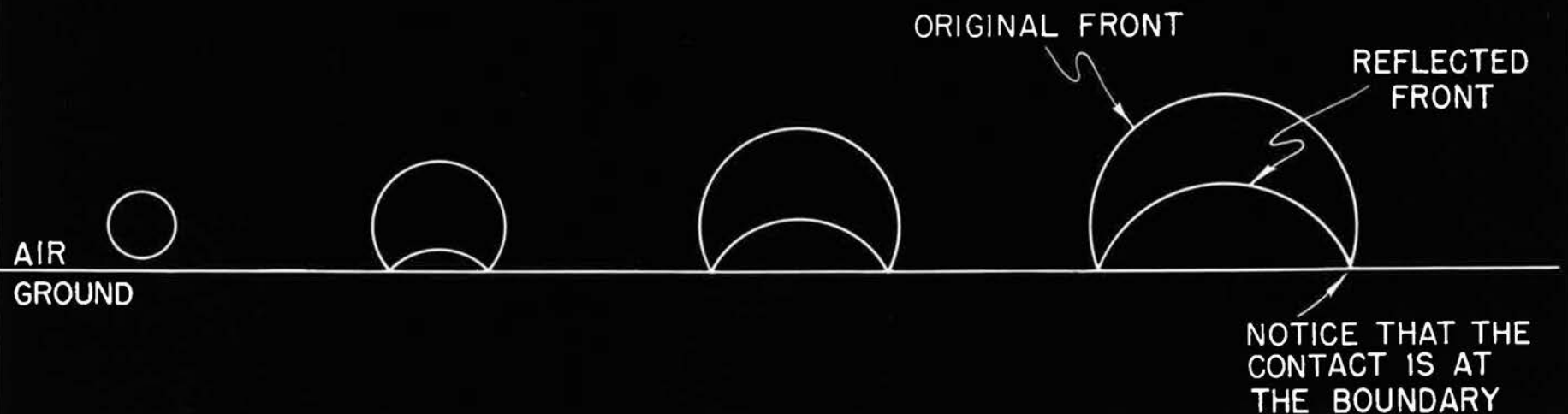
6.23



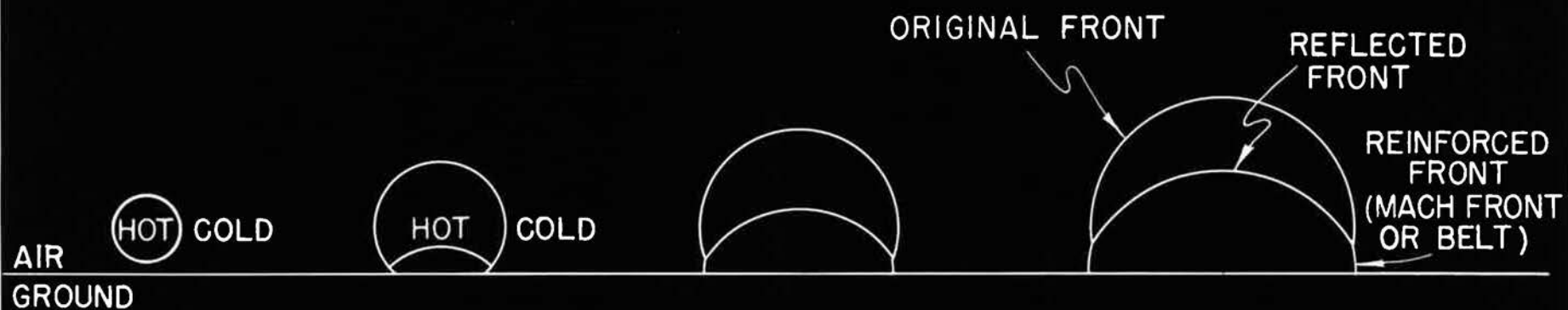
SOON AFTER THE  
GROUNDSTRIKE A  
A DUST SKIRT AP-  
PEARS. ABOVE THE  
SKIRT AT 3.6 MS  
APPEARS A BRIGHT  
BELT THAT WILL BE  
NOTICEABLE WITH  
VARYING CONTRAST  
FOR ABOUT 100 MS.  
THIS IS THE "MACH  
FRONT," CAUSED BY  
THE ENHANCEMENT  
OF THE VELOCITY  
NEAR THE GROUND.  
WHERE THE REFLECT-  
ED WAVE REINFORCES  
THE DIRECT ONE.

THE BELT NEAR THE GROUND (PARTLY HIDDEN BY THE DUST SKIRT) IS THE MACH WAVE, A PHENOMENON PREVIOUSLY KNOWN IN SHOCK WAVE REFLECTION, BUT NEVER BEFORE OBSERVED SO STRIKINGLY.

WHEN AN ORDINARY WAVE, SUCH AS LIGHT, OR SOUND, OR A WATER RIPPLE, STRIKES AN OBSTACLE, THE REFLECTED WAVE FRONT REMAINS JOINED TO THE ORIGINAL FRONT AT THE BOUNDARY OF THE OBSTACLE.



BUT A SHOCK WAVE FRONT TRAVELS FASTER THE STRONGER IT IS, AND FASTER IN HOT AIR THAN IN COLD. MOREOVER, IT HEATS THE AIR. THE REFLECTED FRONT THUS TRAVELS FASTER THAN THE ORIGINAL SHOCK FRONT, CATCHES UP WITH IT, AND RIDES UP ON IT IN A COMMON, REINFORCED FRONT WHICH TRAVELS FASTER THAN THE ORIGINAL BECAUSE IT IS STRONGER. THIS IS CALLED THE MACH FRONT.





THE SPIKES HAVE STRUCK THE GROUND BETWEEN 2.0 AND 2.4 MS. IN THE REGION WHERE EACH SPIKE STRUCK, THERE APPEARS, BETWEEN 5 AND 8 MS. A BRIGHT V-SHAPED PART IN THE SKIRT. BY 12 MS IT IS VERY BRIGHT. IT LASTS UNTIL ABOUT 40 MS.

15 MS.

N

THE BELT, STILL HOT, IS NOW CLEARLY  
LARGER THAN THE BALL OF FIRE.

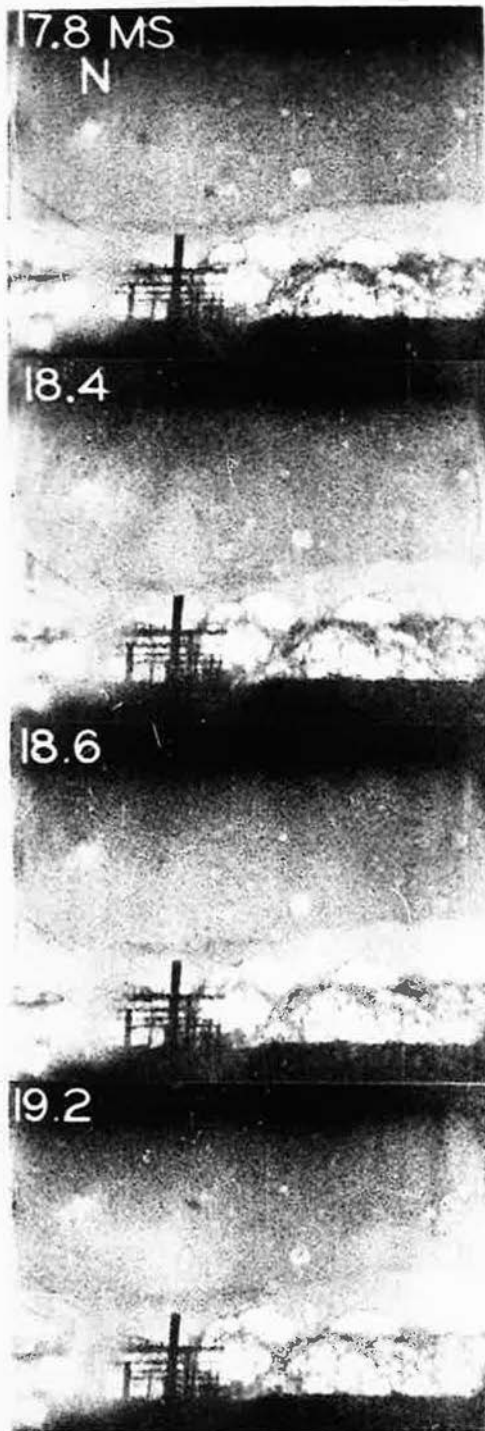


CABLE TO  
BARRAGE  
BALLOON

THE EDGE APPEARS AS BRIGHT AS THE CENTER.







THE MACH FRONT, ORIGINALLY BRIGHTER THAN THE BALL, BEGINS TO APPEAR DARKER THAN THE BALL AT ITS UPPER EDGE, AT 15 MS. THIS REVERSAL OF CONTRAST HAS REACHED THE EDGE OF THE BALL BY 20 MS, AND THE BOTTOM OF THE VISIBLE PART OF THE MACH FRONT BY 25 MS.

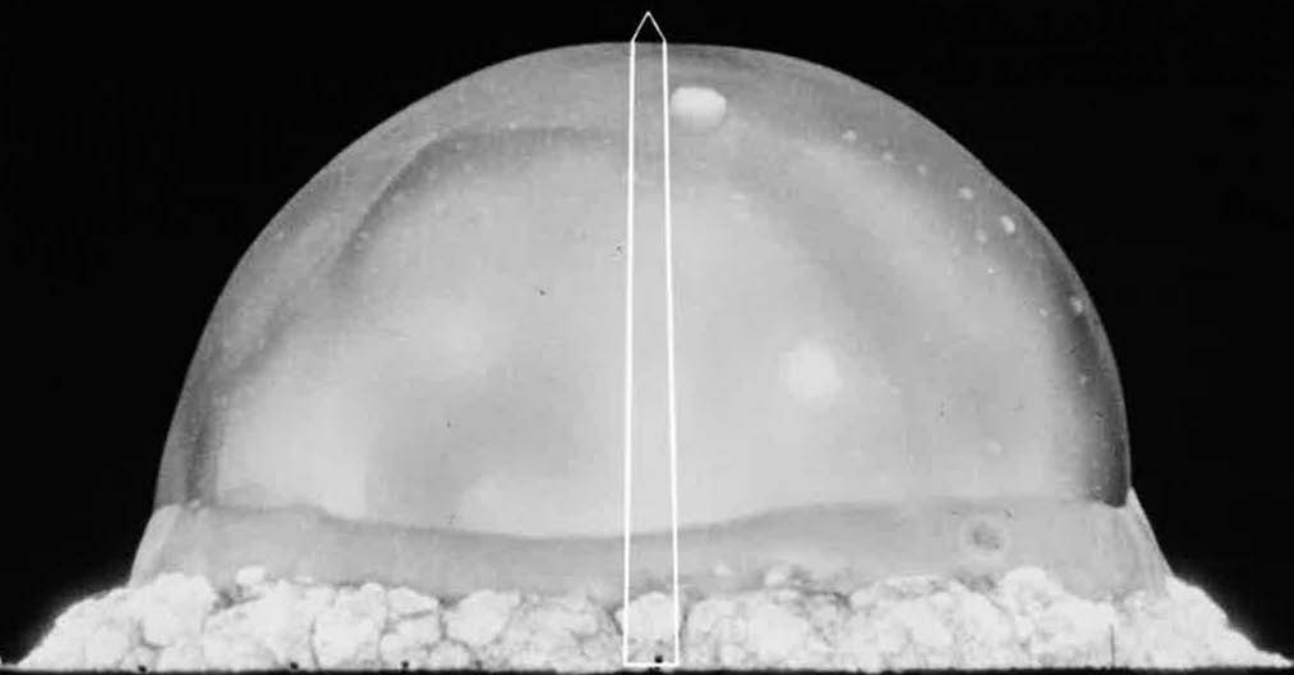
25 MS.

N



THE CENTRAL BALL OF FIRE, WHICH HAS NO SHARP BOUNDARY, HENCEFORTH INCREASES IN SIZE ONLY VERY SLOWLY. THE SHARPLY DEFINED SHOCK FRONT HAS BEGUN TO LEAVE IT BEHIND; THE REGION NEAR THE EDGE, WHOSE BRIGHTNESS IS DUE SOLELY TO THE SELF-LUMINOUS SHOCK FRONT, IS LESS BRIGHT THAN THE CENTER.

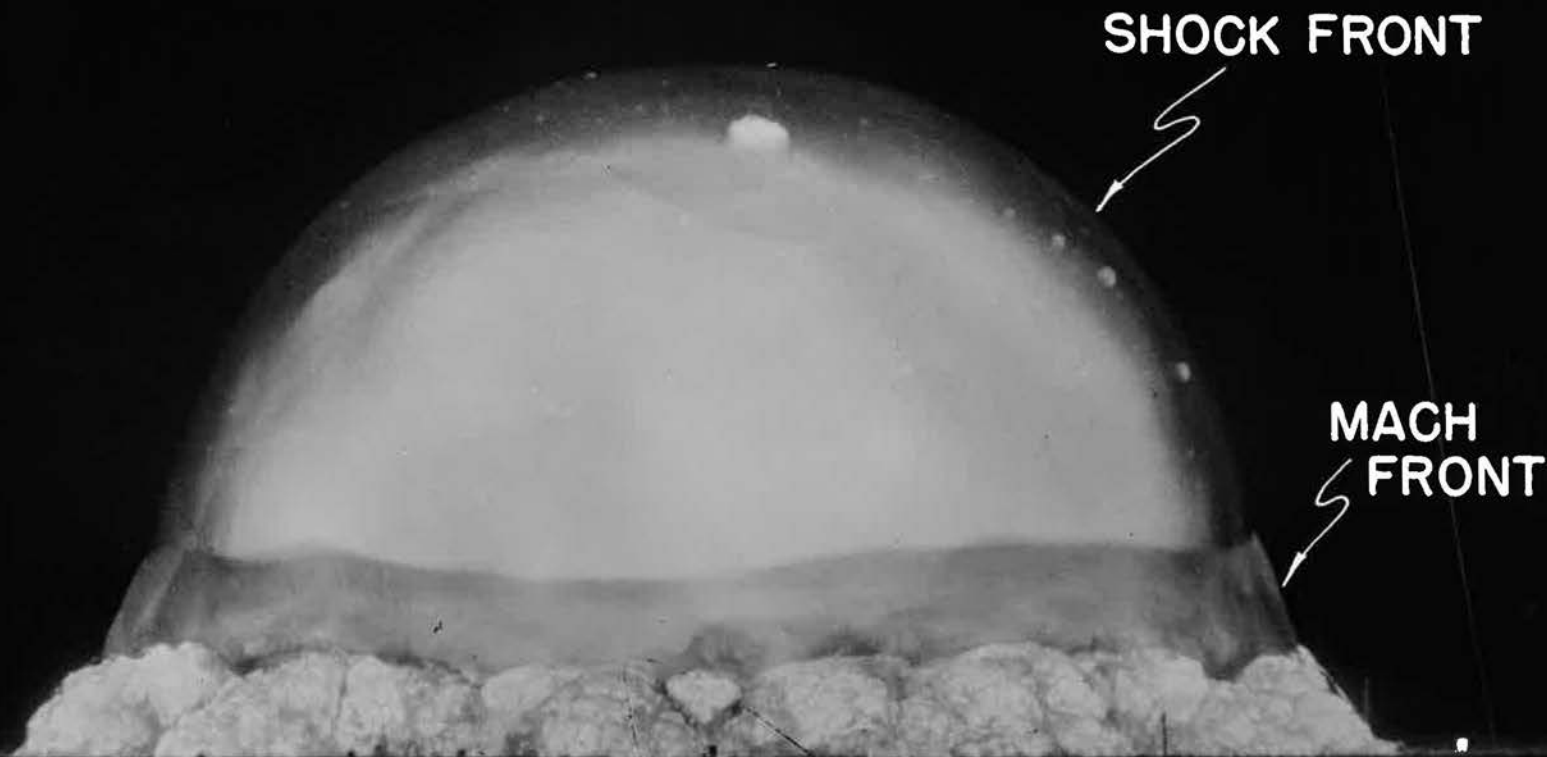
25 MS.  
N



WASHINGTON  
MONUMENT

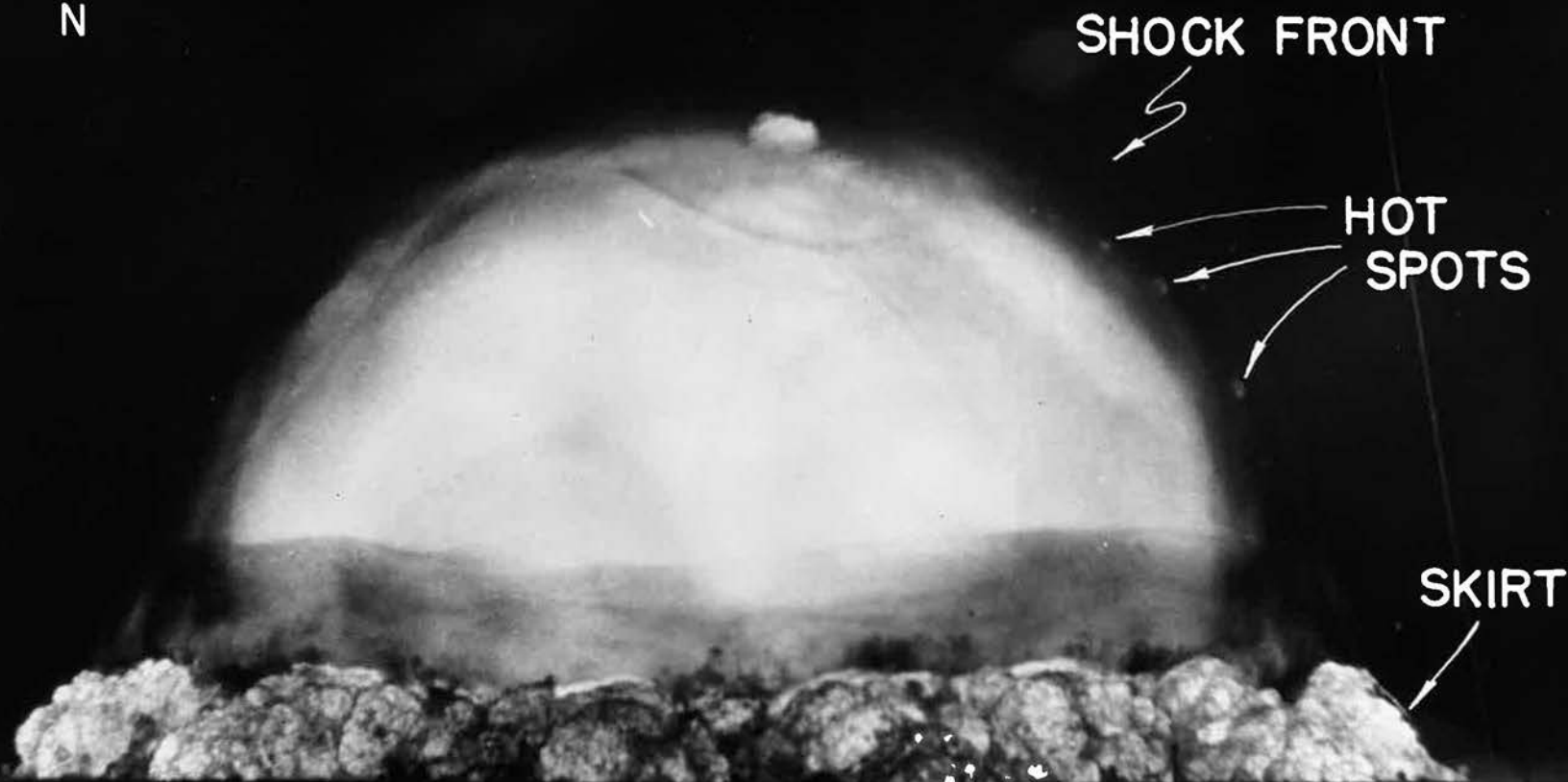


34 MS.  
N



THE MACH FRONT (BELT) IS HOTTER AND MORE OPAQUE THAN THE SHOCK FRONT. BOTH FRONTS ARE MUCH COOLER THAN THE CENTRAL BALL OF FIRE. THE MACH FRONT APPEARS DARKER THAN THE SHOCK FRONT NEAR THE CENTER ON ACCOUNT OF ITS GREATER OPACITY. THE CONTRAST IS REVERSED NEAR THE EDGE, WHERE ITS HIGHER TEMPERATURE MAKES THE MACH FRONT APPEAR BRIGHTER THAN THE SHOCK FRONT.

44 MS.  
N




THE SHOCK FRONT AND MACH FRONT ARE VERY FAINT. SEVERAL HOT SPOTS, APPARENTLY ALMOST DETACHED FROM THE BALL OF FIRE, ARE STILL QUITE PROMINENT. THE LUMPY DUST SKIRT, THOUGH COOLER THAN THE BALL OF FIRE, IS MUCH HOTTER THAN THE SHOCK FRONT AND MACH FRONT.

---

53 MS.  
N

DARK WAVE

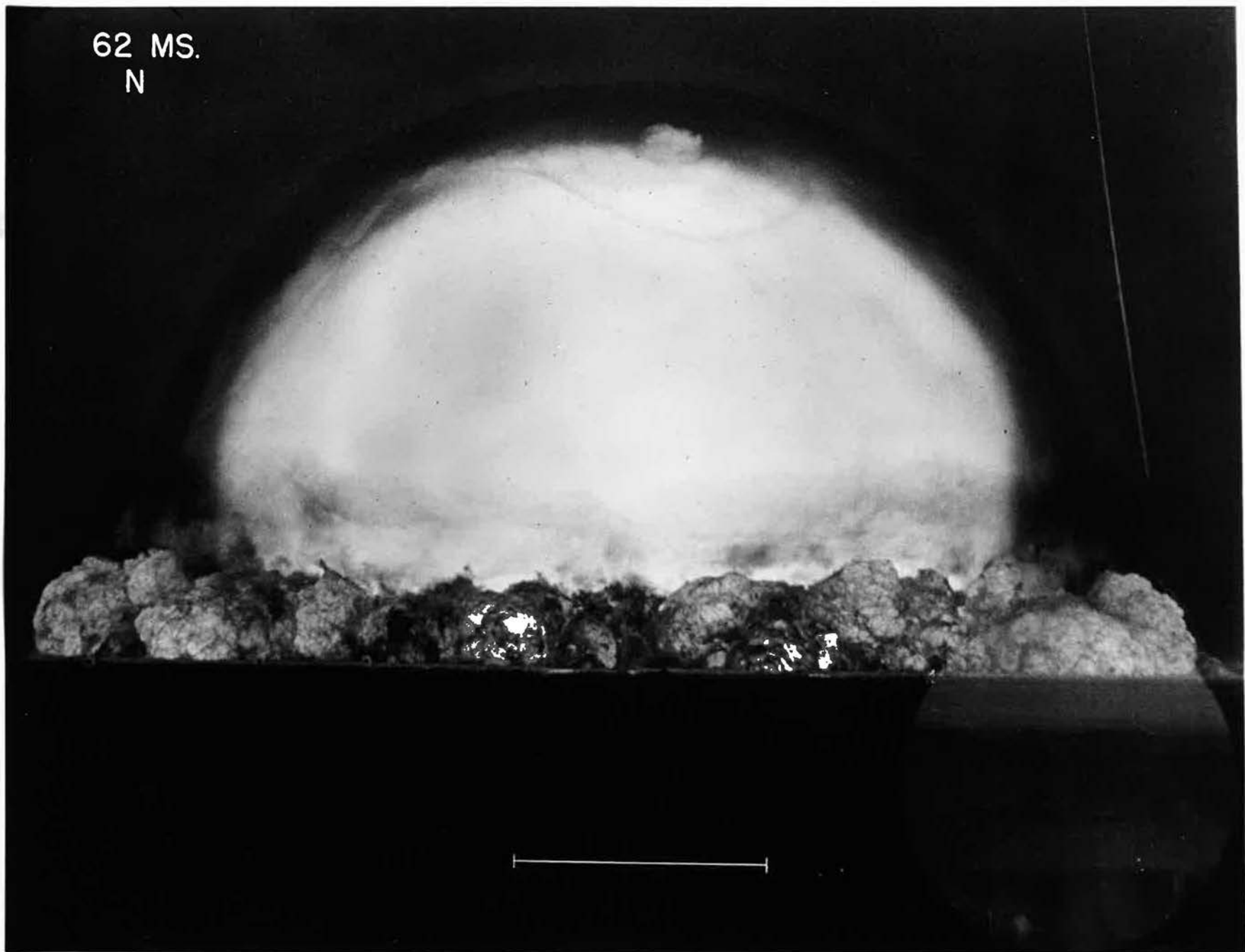
SHOCK  
WAVE



THE SHOCK WAVE IS FOLLOWED AT AN INCREASING  
DISTANCE BY A DARK WAVE CAUSED BY THE FORMA-  
TION OF CHEMICAL COMPOUNDS OF THE ELEMENTS  
IN THE ATMOSPHERE FROM THE GREAT PRESSURE  
AND HEAT OF THE SHOCK.

18

62 MS.  
N



62 MS.  
N


SHOCK FRONT

DARK  
FRONT

THIS PICTURE IS THE SAME AS THE PRECEDING ONE, EXCEPT THAT IT IS PRINTED IN HIGH CONTRAST TO ACCENTUATE THE SHOCK FRONT AND THE DARK FRONT.

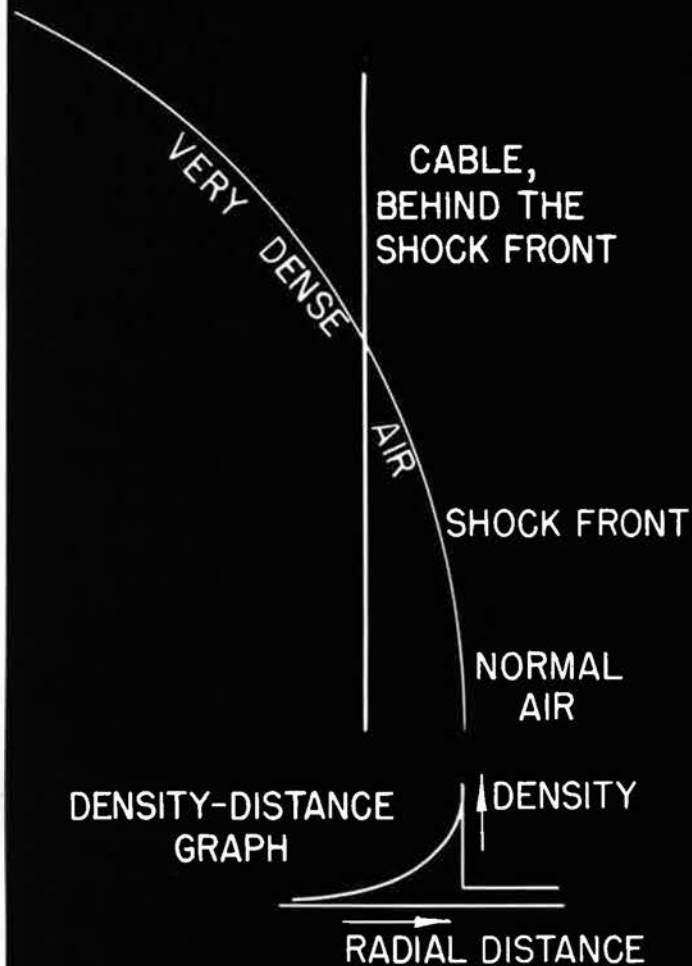


72 MS.  
N



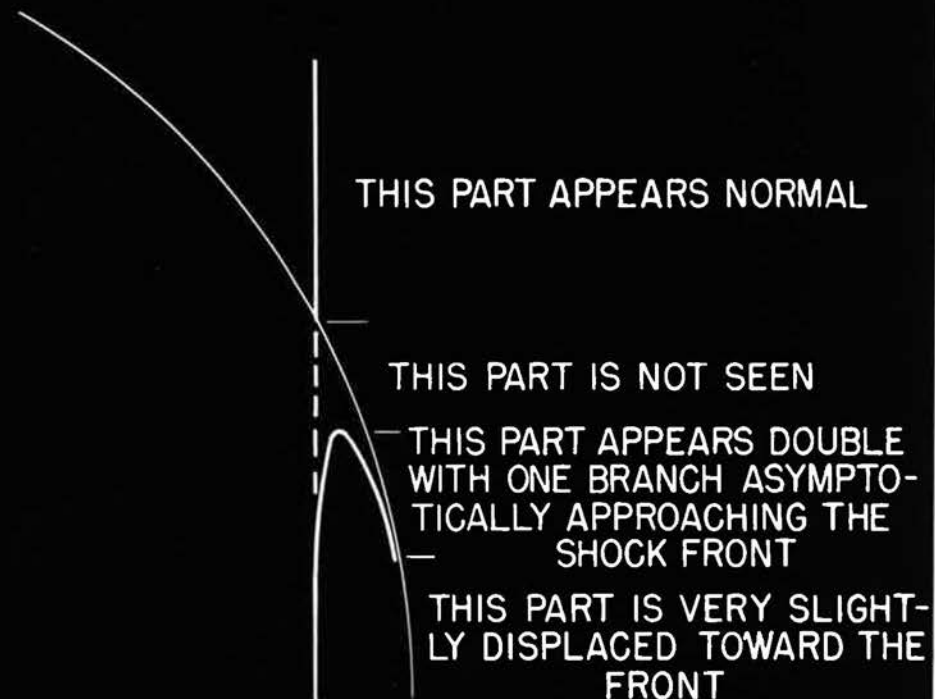
THE DENSE SHELL OF COMPRESSED AIR AT THE SHOCK SURFACE (NOW INVISIBLE) REFRACTS THE LIGHT FROM THE CABLE BEHIND THE SPHERE, GIVING THE ILLUSION OF A BREAK ADVANCING UP THE CABLE.

## GEOMETRIC PROJECTION



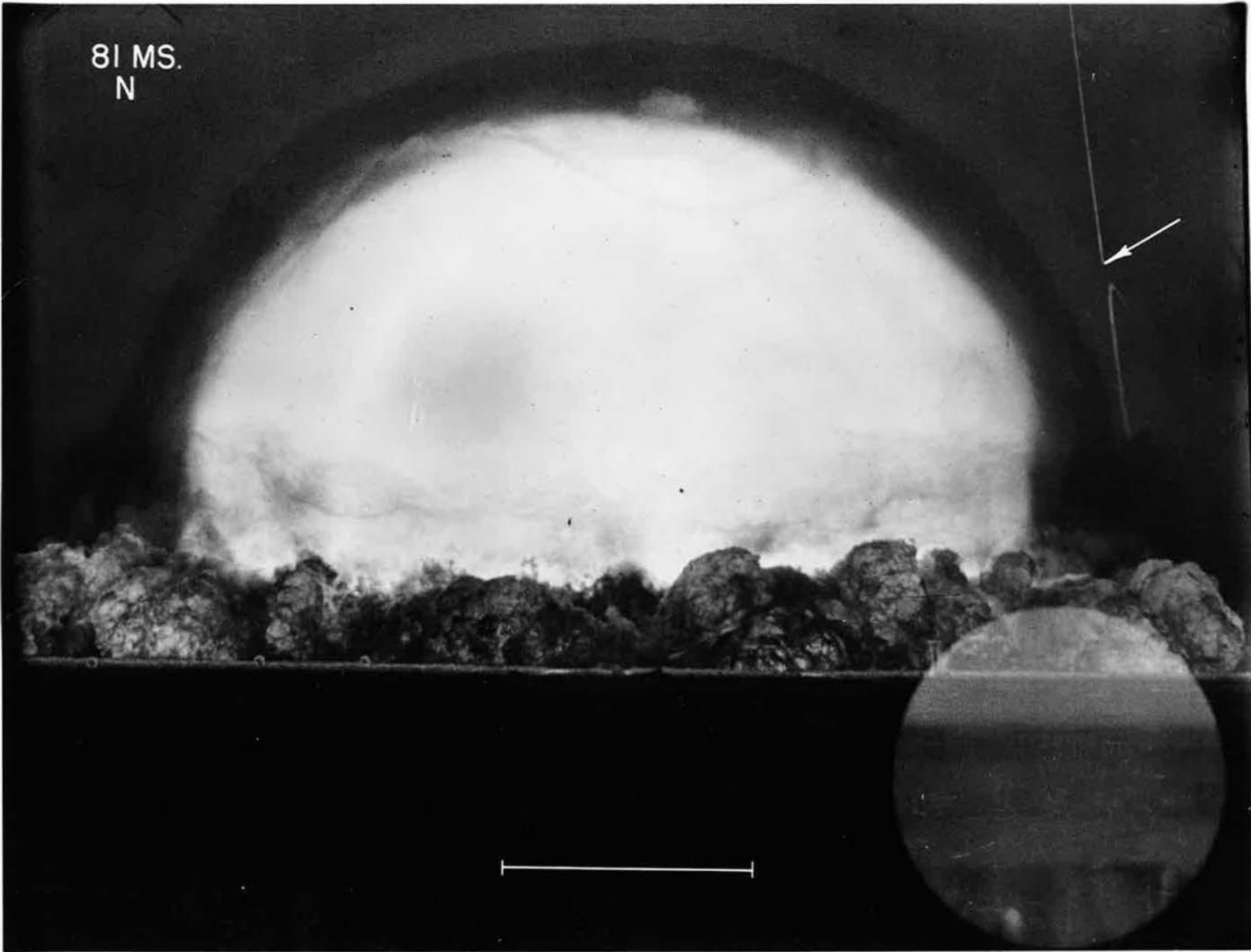
LIGHT FROM THE CABLE INTERSECTS THE VERY STRONG SHOCK FRONT. JUST BEHIND THE FRONT, THE AIR IS MUCH DENSER THAN THE NORMAL AIR.

## APPEARANCE OF THE CABLE, REFRACTED BY THE SHOCK FRONT.



THE LIGHT FROM THE CABLE IS DEVIATED BY REFRACTION AT THE SURFACE OF THE DENSE SHOCK FRONT, MAKING THE CABLE APPEAR BROKEN. THE PHENOMENON IS THE SAME IN PRINCIPLE AS THE APPARENT BREAK IN A STICK IMMERSSED IN WATER.

81 MS.  
N



90. MS.  
N





100 MS.  
N

THE BELT IS HARDLY VISIBLE. THE SKIRT OF  
DUST IS NOW QUITE COOL.



109 MS.  
N



118 MS.  
N



127 MS.  
N

WE SHALL REVERT TO THIS SCENE AT 2 SEC.

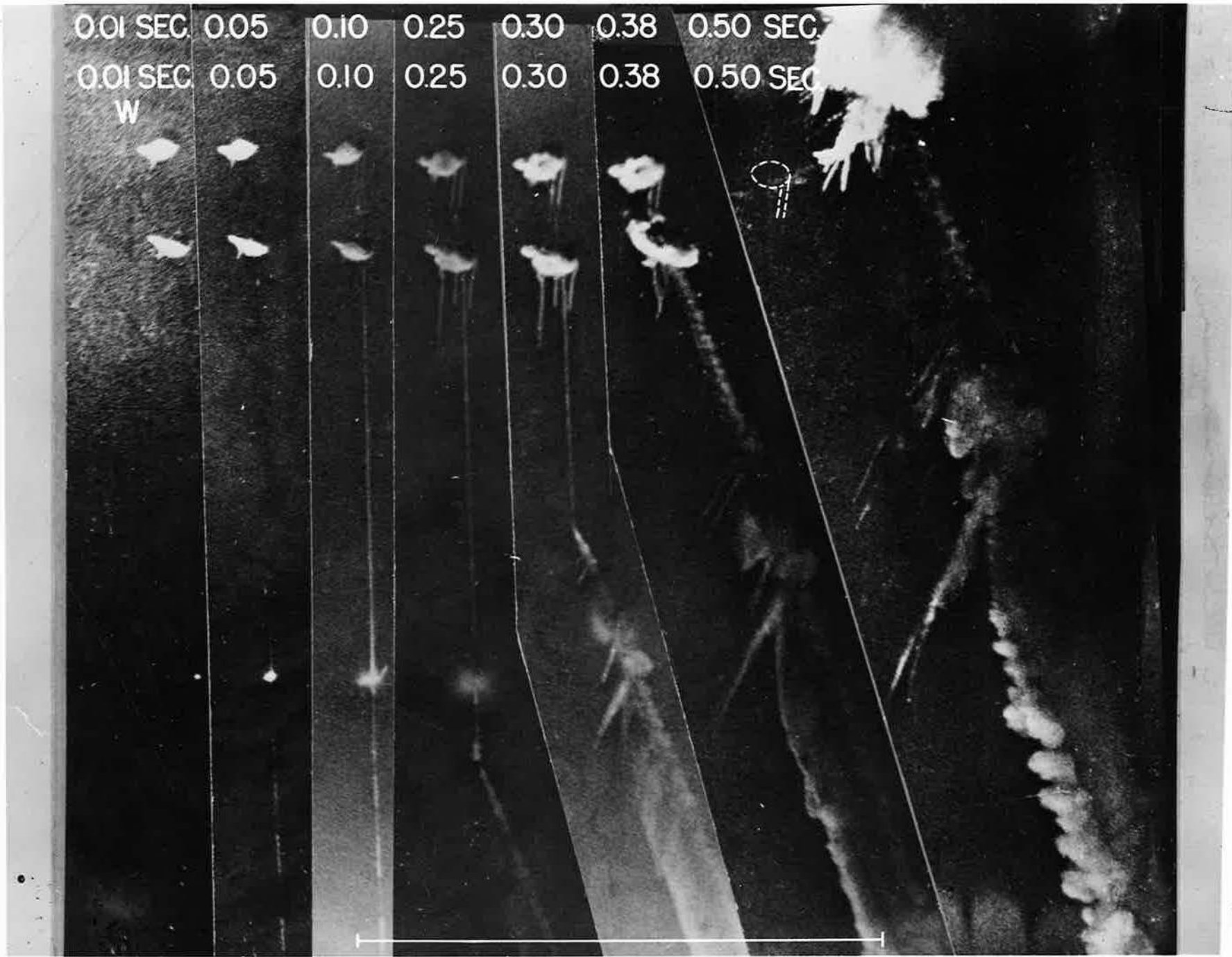




THE CAMERA WAS AIMED ABOVE AND TO THE RIGHT OF THE EXPLOSION FOR THE NEXT (COMPOSITE) PICTURE. EARLIER FRAMES SHOW THE VAPORIZATION OF THE INITIALLY INVISIBLE BALLOON CABLE. THE SHOCK WAVE, AS IT REACHES THE CABLE, BLOWS IT ASIDE AT HIGH SPEED.

SHOCK FRONT INTERSECTION WITH THE PLANE OF THE CABLE

30  
250 MS.  
OR 0.25 SEC. W  
CENTER



8.1 SEC.  
NW

THE NEXT FOUR PICTURES WERE TAKEN FROM A HILL-TOP 20 MILES AWAY. THE SCALE IS ONLY ONE-FIFTIETH THAT OF THE PICTURES YOU HAVE JUST SEEN.

NOTICE THE CLEAR SKY IN THIS PICTURE AND THE SUCCESSIVE CLOUD RINGS PRODUCED BEHIND THE SHOCK FRONT AS THE RAREFACTION CAUSES SUPERSATURATION IN MOIST LAYERS BETWEEN TWO AND FOUR MILES ABOVE THE GROUND. THESE CLOUD RINGS ARE NOT SHOWN IN THE MOTION PICTURES.



EMPIRE STATE BLDG.

11.5 SEC.  
NW



14.8 SEC.  
NW



18.1 SEC.  
NW




2.000 SEC  
N

RETURNING INTO A PREVIOUS SCENE: THE DISTURBED REGION IS MUCH LARGER THAN BEFORE. THE RELATIVELY COOL DUST SKIRT COVERS MOST OF THE FIELD OF THE PICTURE. THE NEXT PICTURE WILL BE IDENTICAL WITH THIS EXCEPT FOR ITS SCALE.



2 SEC.  
N



THIS PICTURE COVERS A MUCH LARGER AREA, ON A SMALLER SCALE THAN THE PREVIOUS ONE. MOST OF THE BALL OF FIRE IS HIDDEN BY THE DUST SKIRT. TWO PAIRS OF VAPORIZED BALLOONS MAY BE SEEN. (THE BLACK SPOT IS SOLARIZED. THE AREA IS REALLY MUCH BRIGHTER THAN THE REST OF THE FIELD.)

—|—



4 SEC.  
N



A GREAT VERTICAL CONVECTION CURRENT HAS STARTED, CARRYING HOT GASES AND DUST UPWARD THROUGH THE CENTER OF THE SKIRT. A NECK IN THE DUST SKIRT SHOWS WHERE A STEM IS ABOUT TO FORM. THE PORTION OF THE SKIRT ABOVE THE NECK IS NOW A GREAT VORTEX RING, IN THE FORM OF A TORUS, OR "DOUGHNUT". THE MATTER IN THE CONVECTION CURRENT IS SPILLING OUT OVER THE TORUS, AND FORMING WITH IT A NEW CLOUD OF SMOKE.

CROSS SECTIONS (SCHEMATIC):

THE CONVECTIVE RISE STARTS AS FOLLOWS:

0.1 SEC.



THE SHOCK FRONT AND CONSEQUENT RAREFACTION PHASE PASS AWAY IN ABOUT  $\frac{1}{4}$  SECOND, LEAVING STILL, RAREFIED AIR.

2.0 SEC.



THE LIGHT, HOT AIR BEGINS TO RISE, AND COOL AIR FROM THE OUTSIDE COMES IN.

3.5 SEC.



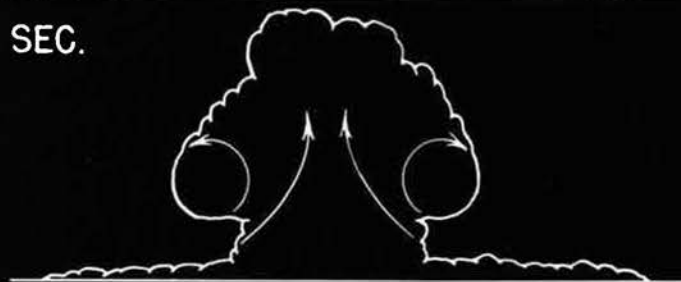
THE INWARD AND UPWARD SWEEP OF AIR PRODUCES A NECK IN THE SKIRT MATERIAL. TURBULENT MIXING MAKES THE BOUNDARIES RATHER INDEFINITE.

4 SEC.



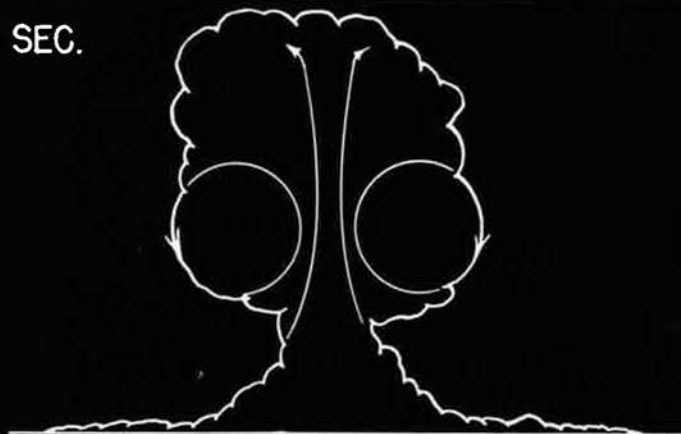
THE UPRUSH OF AIR MAKES THE SKIRT MATERIAL ABOVE THE NECK INTO A VORTEX RING.

8 SEC.



THE MATERIAL CARRIED THROUGH THE RING PILES UP OVER IT, ENLARGING THE CLOUD.

15 SEC.



THE CLOUD, MADE OF THE RING AND SUPERPOSED MATTER, GRADUALLY CHANGES SHAPE INTO A BALL AS IT RISES.

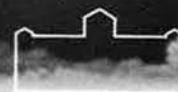
10 SEC.  
N



THE SMOKE FROM THE VORTEX, SPILLING OVER  
THE TORUS, IS CHANGING THE SHAPE OF THE  
CLOUD.

—|

10 SEC.  
N



WASHINGTON  
MONUMENT

EMPIRE STATE BLDG.  
WITH SURROUNDING  
20-STORY BUILDINGS

CHICAGO  
MERCANDISE  
MART



20 SEC.

N



THE SMOKE CLOUD IS NOW ALMOST SPHERICAL. THE TORUS OF THE ORIGINAL SKIRT MATERIAL CAN STILL BE DISTINGUISHED. FLAMES SPURT OUT NOW AND THEN, WHERE COMBUSTION IS STILL INCOMPLETE.




30 SEC.  
N



IN THE DARK OF EARLY DAWN, THE RADIOACTIVE CLOUD, NOW NON-LUMINOUS AND RELATIVELY COOL, IRRADIATES AND IONIZES THE AIR AROUND IT AND CAN BE PHOTOGRAPHED BY THE LIGHT OF THE IONS.

60 SEC.  
N



AS IT PASSES VARIOUS LAYERS OF AIR ON ITS UPWARD TRIP, THE CLOUD PRODUCES DIVERSE METEOROLOGICAL EFFECTS, SUCH AS THE CLOUD RING NEAR THE TOP OF THE CLOUD IN THIS PICTURE. (THIS IS A PHOTOFASH BOMB EXPOSURE.)

THE STEM REMAINS POISED UNTIL IT IS PULLED APART  
BY THE WINDS, MANY MINUTES AFTER THE SMOKE CLOUD  
HAS REACHED THE STRATOSPHERE.

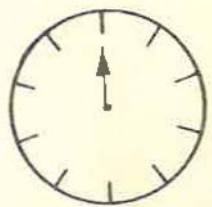
A SMOKE PALL REMAINS ON THE GROUND FOR HOURS.

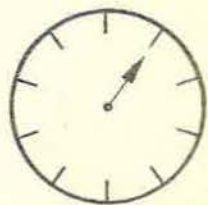


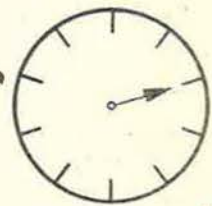


NOW LET US LOOK AT THE MOTION PICTURES.  
THE HAND ON THE DIAL ROTATES ONCE PER  
SECOND, IN STEPS OF ONE-TENTH SECOND.

WHEN A WHITE DISC APPEARS, CONCENTRATE  
ON THE SPOT SO AS NOT TO MISS THE INITIAL  
STAGES OF THE EXPLOSION.

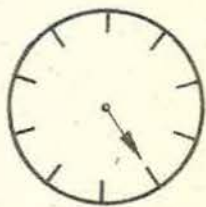


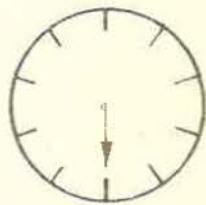


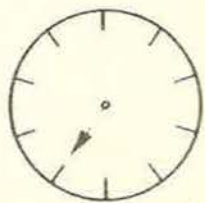


49c

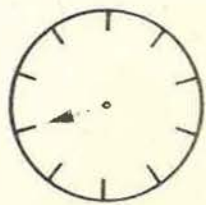




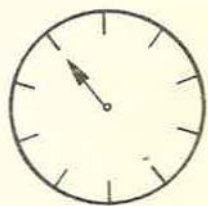












**CAMERA POSITION 5.8 MILES N  
FRAME FREQUENCY, 24 PER SECOND  
35 MM FILM. 75 MM FOCAL LENGTH  
100 METERS**

**THE BLACK SPECKS IN THE FIRST FEW FRAMES  
ARISE FROM THE BURNING OF THE ORIGINAL  
FILM BY THE HEAT FROM THE BOMB. THE  
PATTERN DOES NOT REPRESENT ANYTHING  
IN THE ACTUAL SCENE.**



**CAMERA POSITION 5.8 MILES N  
FRAME FREQUENCY, 107.1 PER SECOND  
35 MM FILM. 450 MM FOCAL LENGTH  
100 METERS**

**THE WHITE AREA AT THE LOWER RIGHT  
HAS NO MEANING FOR THE SCENE. IT IS  
CAUSED BY EXTRANEIOUS LIGHT IN THE CAMERA.**

CAMERA POSITION 5.8 MILES W  
FRAME FREQUENCY, 119 PER SECOND  
35 MM FILM. 610 MM FOCAL LENGTH

100 METERS

AIM, APPROXIMATELY  $30^{\circ}$  TO THE RIGHT OF VERTICAL  
400 METERS FROM THE EXPLOSION CENTER

CAMERA POSITION 5.8 MILES W  
FRAME FREQUENCY, 660 PER SECOND  
16 MM FILM. 152 MM FOCAL LENGTH

100 METERS

AFTER ABOUT THREE SECONDS OF SHOWING,  
WATCH THE SHOCK FRONT STRIKE THE CABLE  
(EXTREME RIGHT)



CAMERA POSITION 5.8 MILES N  
FRAME FREQUENCY, 651 PER SECOND  
· 16 MM FILM. 152 MM FOCAL LENGTH

100 METERS

CAMERA POSITION 5.8 MILES W  
FRAME FREQUENCY, 3560 PER SECOND  
16 MM FILM. 152 MM FOCAL LENGTH

100 METERS

AFTER ABOUT ONE SECOND OF SHOWING,  
WATCH THE BRIGHT CURTAIN RISE ACROSS  
THE FACE OF THE BALL.

CAMERA POSITION 5.8 MILES N  
FRAME FREQUENCY, 3760 PER SECOND  
16 MM FILM. 254 MM FOCAL LENGTH  
100 METERS

CAMERA POSITION 0.45 MILES N  
FRAME FREQUENCY, 3700 PER SECOND  
16 MM FILM. 50 MM FOCAL LENGTH

100 METERS

CAMERA POSITION 0.45 MILES W  
FRAME FREQUENCY, 7110 PER SECOND  
8 MM FILM. 50 MM FOCAL LENGTH  
100 METERS

A black and white landscape photograph showing a wide, flat expanse, possibly a plain or a large body of water, under a dramatic, cloudy sky. The foreground is dark and silhouetted, suggesting a low horizon line. The text "THE END" is overlaid in the center of the image in a white, sans-serif font.

THE END

UNCLASSIFIED

DOCUMENT ROOM

REC. FROM g  
DATE 5/17/60  
REC. NO. REC.

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